

PHASE SHIFTED TEST PATTERN FOR MONITORING FOCUS AND ABERRATIONS
IN OPTICAL PROJECTION SYSTEMS

ABSTRACT

5 A method is described for determining lens aberrations using
a test reticle and a standard metrology tool. The method
provides test patterns, preferably in the form of standard
overlay metrology test patterns, that include blazed gratings
having orientation and pitch selected to sample desired portions
10 of the lens pupil. The method measures relative shifts in the
imaged test patterns using standard metrology tools to provide
both magnitude and sign of the aberrations. The metrology tools
need not be modified if standard test patterns are used, but can
be adapted to obtain additional information. The test reticles
15 may be formed with multiple test patterns having a range of
orientations and pitch in order to compute any desired order of
lens aberration. Alternatively, single test patterns may be used
to determine both the magnitude and sign of lower order lens
aberrations, such as defocus or coma.